YELLOW-BILLED CUCKOO
Coccyzus americanus

Author: Stephen A. Laymon, Wildlife Ecologist, P.O. Box 1236, Weldon, CA 93283

Management Status: Federal: None
California: Endangered (CDFG, 1998)

General Distribution:

Yellow-billed Cuckoos (*Coccyzus americanus*) have a wide distribution throughout North America. They breed from the West Indies and northern third of Mexico north to extreme southern Canada (AOU, 1983) and winter from northern South America south to northern Argentina, primarily east of the Andes, excluding the Amazon Basin (AOU, 1983; Hughes, 1999) There are scattered winter records from Central America and the West Indies (Hughes, 1999).

The western subspecies, the California Yellow-billed Cuckoo (*C.a. occidentalis*), has a much smaller range and more restrictive habitat requirements. It breeds in scattered locations where suitable habitat is available throughout California, Idaho, Utah, Arizona, New Mexico, extreme western Texas, and possibly Nevada and western Colorado (Gaines and Laymon, 1984). In Mexico it breeds south to the Cape region of Baja California, Sinaloa, and Chihuahua (AOU, 1957). Historically, it has bred north to southern British Columbia (AOU, 1957).

A statewide survey of Yellow-billed Cuckoos in California conducted during 1986 and 1987 found a total of 30-33 pairs and 31 unmated males at nine localities (Laymon and Halterman, 1989). The majority of the cuckoos were concentrated along the upper Sacramento River from Red Bluff to Colusa (18 pairs and 19 unmated males) and at the South Fork Kern River (7 pairs and 3 unmated males). The remaining cuckoos were found at scattered locations including: 1 pair and 5 unmated males along the Feather River; 1-4 pairs in the Prado Flood Control Basin; 1 unmated male at the Mojave River near Hodge; 1 unmated male in the Owens Valley; 1 pair along the Amargosa River near Tecopa; 1 pair and 1 unmated male along the Colorado River north of Blythe; 1 unmated male along the Colorado River in the Picacho Region; and 1 pair along the Colorado River in the Laguna Dam Region (Laymon and Halterman, 1989).

More recent surveys on the Sacramento River from 1988-1990 have shown a fluctuating population of 23-35 pairs depending on the year (Halterman 1991). Continuous surveys on the South Fork of the Kern River from 1985-1996 have shown a population that varied from a low of 2 pairs in 1990 to a high of 24 pairs in 1992 (Laymon et al., 1997). These two sites are the only localities in California that sustain breeding populations of Yellow-billed Cuckoos.

Distribution in the West Mojave Planning Area:

There are no confirmed nesting areas within the WMPA. Cuckoos have been observed during the breeding season at several locations along the Mojave River between Victorville and Barstow. Most of these sightings have been of unmated males (Gaines and Laymon, 1984; Laymon and Halterman, 1989). They probably breed at Mojave Narrows near Victorville, but nests or fledged young have not been located (Stephen Myers pers. comm.). Yellow-billed Cuckoos could occur in migration at any desert oasis with willows and cottonwoods, although

there are very few records for migrant Yellow-billed Cuckoos within the WMPA (Garrett and Dunn, 1981; Gaines and Laymon, 1984; Laymon and Halterman, 1989).

Cuckoos nest at three localities just outside of the WMPA. A major breeding population of 10-20 pairs is found in the South Fork Kern River Valley at Weldon (Laymon et al., 1997). Small and unstable breeding populations are found along the Amargosa River near Tecopa and at several locations in the Owens Valley.

Natural History:

Yellow-billed Cuckoos are elegant streamlined birds with rich brown upper parts and creamy white under parts. The primaries and outer tail feathers have a rufous tinge. The under tail is black with prominent white spots, typical of many members of the cuckoo family. Yellow-billed Cuckoos have a yellow to orange lower mandible contrasting with a black upper mandible. In western birds the bill tends to be brighter orange than in the east. Though gender can not be safely determined in the field, females are larger than males and tend to have brighter orange bills and larger white spots on the under tail. Yellow-billed Cuckoos (30 cm, 12 in) are longer than a Western Scrub-jay (*Aphelocoma californica*; 29 cm, 11.75 in), but weigh much less (cuckoo 64 gm vs. scrub-jay 80 gm; Oberholser, 1974; Dunning, 1984).

Yellow-billed Cuckoos are primarily foliage gleaning insectivores, but also hover glean, hawk, and even hop on the ground to obtain their prey (Ehrlich et al., 1988; S.A. Laymon pers. obs.). In the east, the cuckoo's prey consists mostly of hairy caterpillars, with lesser numbers of bird eggs, frogs, lizards, berries, and fruit (Ehrlich et al., 1988). On the South Fork Kern River, in California, the diet of cuckoos, based on 2420 prey items brought to nests, consists of green caterpillars (predominately Sphinx moth larvae; 44.9%), tree frogs (23.8%), katydids (21.8%), and grasshoppers (8.7%). The remaining 1.3% of the diet includes cicadas, dragonflies, butterflies, moths, beetles, and spiders (Laymon et al., 1997). The provisions that are brought to the young are whole prey items, with the exception of the first few hours after hatching when young are fed regurgitated food (S.A. Laymon pers. obs.; contra Ehrilch, 1988).

During spring migration, Yellow-billed Cuckoos generally arrive in California during June, though there are a few early records for May (Gaines and Laymon, 1984). Nesting generally begins shortly after their arrival, though in some years, presumably those with low food availability, nesting is delayed for up to a month after arrival (S.A. Laymon pers. obsv.). A clutch consists of 2-5 light bluish-green unmarked eggs. Incubation begins with the first egg laid leading to asynchronous hatching. Of 90 nests at the South Fork Kern River, most were initiated in July (67.8%), while fewer were initiated in June (31.1%) and only one was initiated in August (1.1%) (S.A. Laymon unpublished data).

Yellow-billed Cuckoos are normally solitary nesters, though nests of adjacent pairs can be as close as ?? ft (100 m). Cuckoos are normally monogamous, but at the South Fork Kern River, up to one-third of the nests are tended by a helper male in addition to the dominant male and female of the pair (S.A. Laymon pers. obs.). The helper males provide as much as one-third of the food to the young. The male and female spend equal amounts of time tending the nest, except that the male does all the nocturnal incubation and brooding (S.A. Laymon pers. obs.).

In most years Yellow-billed Cuckoos lay only one clutch of eggs. In years of above average food supply many pairs lay two clutches and successfully fledge two broods. In 1992, presumably a year of high food supply, most pairs at the South Fork Kern River double clutched.

In addition, several pairs triple clutched and successfully fledged young from three successive nests (Laymon et al., 1993).

Yellow-billed Cuckoos build a loose platform (saucer) nest of sticks and twigs, lined with leaves and other vegetation (Ehrlich et al., 1988; S.A. Laymon pers. obsv.). The nest is 6-7 in. (15-17.5 cm) in diameter. Nests are usually placed two-thirds distance out from the trunk to the tip on horizontal branches, though some are in forks or crotches of trees.

Fall migration begins in early August and most cuckoos have departed California by mid-September (Gaines and Laymon, 1984). By mid-August, vocalizations have become less frequent and softer and, hence, the species is harder to detect (S.A. Laymon pers. obs.).

Detection of the species is often made by vocalization. Unmated males cuckoos make a series of cooing calls, similar to a Mourning Dove. This can be considered the species song. As soon as the male finds a mate, he no longer uses the cooing song. The most common call of the cuckoo is the kowlp call, which is as follows, ca-ca-ca-ca-ca-kow-kow-kow. This call is used for contact between members of a pair and less often between members of adjacent pairs. This is the call that should be broadcast when surveying for the species (Laymon, 1999).

Habitat Requirements:

Yellow-billed Cuckoos have one of the most restrictive suite of macro-habitat requirements of any bird species. Not only are they restricted to a single habitat type, but the size and configuration of the habitat is also extremely important. During the breeding season in California, they are confined to cottonwood-willow riparian habitat. Cuckoos have large home ranges, often exceeding 50 acres (20 hectares), and sometimes approaching 100 acres (40 ha), in extent (Laymon and Halterman, 1985).

Gaines and Laymon (1984) concluded that willow-cottonwood habitat of any age with high humidity and a habitat breadth of 325 ft (100 m) was necessary for suitable Yellow-billed Cuckoo habitat. Additional research based on occupancy rates allowed for refinement of these requirements (Laymon and Halterman 1989). Away from the Colorado River in California, 9.5% of the 50-100 acre (20-40 ha) sites (n=21), 58.8% of the 101-200 acre (41-80 ha) sites (n=17), and all of the >200 acre (80 ha) sites (n=7) were occupied. Laymon and Halterman (1989) concluded that sites >200 acres (80 ha) in extent and wider than 1950 ft (600 m) were optimal, sites 101-200 acres (41-80 ha) in extent and wider than 650 ft (200 m) were suitable, sites 50-100 acres (20-40 ha) in extent and 325-650 ft (100-200 m) in width were marginal, and sites <38 acres (15 ha) in extent and <325 ft (100 m) in width were unsuitable.

During a four-year study of Yellow-billed Cuckoos on the Sacramento River, Halterman (1991) found that (1) habitat patch area, (2) the extent of habitat in a 5 mi. (8 km) section of river, and (3) presence of low woody vegetation were the most important variables in explaining the distribution of cuckoos. These variables combined explained 46% of the variation observed in the distribution of breeding pairs.

Micro-habitat requirements are also important. Nesting groves at the South Fork Kern River are characterized by higher canopy closure, higher foliage volume, intermediate basal area, and intermediate tree height when compared to random sites (Laymon et al., 1997). Sites with less than 40% canopy closure are unsuitable, those with 40%-65% are marginal to suitable, and those with greater than 65% are optimal.

Cuckoos seldom use sites that have a foliage volume of less than 64,354 yds^3/acre (20,000 m^3/ha); these sites are considered unsuitable. Most nest sites have a foliage volume from 96,530

yds^3/acre (30,000m^3/ha) to 289,591 yds^3/acre (90,000m^3/ha); these sites are considered optimal. Also, sites with 64,354 yds^3/acre (20,000m^3/ha) to 96,530 yds^3/acre (30,000m^3/ha) and over 289,591 yds^3/acre (90,000m^3/ha) appear to be suitable (Laymon et al., 1997).

Cuckoos tend to choose nest sites with a mean canopy height of 23-33 ft (7-10 m). This tree height may be optimal for the species. Sites with a mean canopy height from 13-23 ft (4-7 m) are chosen less frequently but appear to be suitable, as are sites with a mean canopy height of 33-49 ft (10-15 m). Sites with a mean canopy height of less than 13 ft (4 m) are unsuitable (Laymon et al., 1997) .

Cuckoos tend to choose nest sites that have a basal area (as defined as the summation of the cross-sectional area of a trees trunk at breast height for a given land area) of between 21.9 5 ft^2/acre (5m^2/ha) and 87.5 ft^2/acre (20m^2/ha); these sites appear to be optimal. Sites with basal area 87.5 ft^2/acre (20m^2/ha) to 240.7 ft^2/acre (55m^2/ha) are not used as frequently, but are suitable. Sites with basal area less than 21.9 ft^2/acre (5m^2/ha) and over 240.7 ft^2/acre (55m^2/ha) are seldom used by cuckoos and can be considered marginal (Laymon et al., 1997).

The presence of at least one willow on the nest site is very important. At the South Fork Kern River, 94 of 95 nests (99%) were in willows (Laymon et al., 1997).

Population Status:

Historically, the California Yellow-billed Cuckoo bred as far north as southern British Columbia. Over the past 80 years the range has decreased in size by approximately 50%. The last breeding records for British Columbia were in 1927, in Washington in 1934, and in Oregon in 1945 (Roberson, 1980). The last breeding record in California north of the Sacramento Valley was at Mt. Shasta in 1951 (Gaines and Laymon, 1984).

The 1986-87 statewide survey for cuckoos in California revealed a decline of 73% to 82% from a similar survey during 1977 (Laymon and Halterman, 1989). The population had dropped to 19 pairs (from 35-68 pairs) in Northern California and to 11-14 pairs (from 87-95 pairs) in Southern California. Most of the decline in Southern California came from a 95% decline on the Colorado River (122 pairs in 1977 to 6 pairs in 1987).

The decline of Yellow-billed Cuckoos, both historically and recently, is due primarily to habitat loss on the breeding grounds. It has been estimated that 95% or more of the original riparian habitat in the Central Valley of California has been lost over the past 150 years since settlement by Europeans (Warner and Hendrix, 1985). In addition, much of the remaining 5% is highly degraded and fragmented, and is not suitable because the patches are too small in extent and too narrow in width.

The extent of the historic breeding population of Yellow-billed Cuckoos in the WMPA is unknown. It is likely that habitat along the Mojave River and at Morongo Valley was more extensive historically than it is today and that a breeding population occurred at least along the Mojave River. It is unlikely that other areas of habitat sizable enough to support a population of Yellow-billed Cuckoos existed, though a pair may have nested at larger oases from time to time.

Threats Analysis:

Habitat loss on the breeding grounds is the primary threat to the Yellow-billed Cuckoo in California. Habitat loss can occur in many ways. Clearing for agriculture has probably removed the largest fraction of riparian habitat in the state, as evidenced by the amount of land that was historically riparian and is now in agriculture (S.A. Laymon pers. obs.). Other important long-

term, and often permanent, causes of riparian habitat loss are: (1) clearing for flood control, (2) flooding behind dams, (3) withdrawal of groundwater causing a lowering of the water table, (4) clearing for urban and suburban development, (5) invasion by exotic vegetation, and (6) long-term (greater than 100 years) intensive year-around grazing. Important temporary losses of riparian habitat are caused by firewood cutting and wildfire.

Recent restoration of riparian habitat has shown the importance of maintaining habitat on the upper flood terrace. In wet years when lower sites are flooded, the upper terrace restoration sites provide foraging habitat for cuckoos early in the breeding season. This is probably because of higher survival of katydid and sphinx moth larvae, which winter underground under cottonwoods and willows on these higher, drier sites (S.A. Laymon pers. obv.).

Other potential threats to Yellow-billed Cuckoos in California are direct causes, such as shooting and indirect causes, such as the effects of pesticides. Shooting could be a problem in dove hunting season during the first half of September, given the similar size, shape, and appearance of the Mourning Dove and the Yellow-billed Cuckoo. This is a potential problem only in the immediate vicinity of riparian habitat.

Pesticides, especially larvacides used in mosquito control, could be a major threat when applied on a widespread area (especially aerially). Along the Stanislaus River at Caswell State Park, larvacides were regularly applied by air during the spring and summer for many years. This resulted in an avifauna depauperate of insect eating birds such as warblers, vireos, orioles, flycatchers, and cuckoos (S.A. Laymon pers. obs.).

Biological Standards:

There are no nesting records for Yellow-billed Cuckoos in the WMPA, although breeding may take place along the Mojave River from the Mojave Narrows down stream (north) to Helendale. The only other site within the project area where suitable breeding habitat exists is at Morongo Valley. This site is too small for a breeding population, though a pair may nest there at some time in the future.

Protection of existing riparian habitat at both Morongo Valley and along the Mojave River is important for the survival of the species in the WMPA. Protection could include: (1) developing a fire management plan with fire brakes around riparian sites, (2) removing exotic vegetation, (3) fencing to exclude livestock and feral domestic animal grazing, (4) excluding firewood cutting, (5) excluding off-road vehicle use, and (6) developing a recreation plan that examines the impacts of recreation on the riparian resource. These are the only sites with potential breeding habitat and the only high quality habitat for migrant cuckoos within the Planning Area.

It is unlikely that restoration of a sufficient amount of riparian habitat could be carried out at Morongo Valley to provide habitat for more than one to two pairs of Yellow-billed Cuckoos. Restoration of riparian habitat along the Mojave River could be more productive but, at present, most of the potential restoration sites are in private ownership and are heavily grazed. Restoration of the ground water table may also be needed below Mojave Narrows before suitable habitat can be restored. Providing habitat for a minimum population of 10 pairs of cuckoos should be the target for any habitat restoration for this species (Laymon and Halterman, 1989). This would require approximately 1000 acres (400 ha) of intact riparian habitat at a site.

Restoration of cottonwoods and willows at oases within the WMPA could provide additional foraging habitat for Yellow-billed Cuckoos during migration. At many oases, removal

of competing exotic vegetation (e.g., salt cedar [*tamarisk sp*.] and giant reed [*Arundo donax*]) will be needed prior to beginning of restoration efforts.

Literature Cited:

American Ornithologists' Union. 1957. The A.O.U. Checklist of North American Birds. 5th ed. Amer. Ornithol. Union, Washington, D.C.

American Ornithologists' Union. 1983. The A.O.U. Checklist of North American Birds. 6th ed. Amer. Ornithol. Union, Washington, D.C.

Dunning, J.B. 1984. Body weights of 686 species of North American birds. Western Bird Banding Association. Monograph No.1.

Ehrlich, P.R., D.S. Dobkins, and D. Wheye. 1988. The Birder's Handbook. Simon and Schuster, Fireside Books, New York.

Gaines, D.A. and S.A. Laymon. 1984. Decline, status and preservation of the Yellow-billed Cuckoo in California. West. Birds 15:49-80.

Garrett, K. and J. Dunn. 1981. Birds of Southern California: Status and Distribution. Los Angeles Audubon Society, Los Angeles, California.

Halterman, M.D. 1991. Distribution and habitat use of the Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*) on the Sacramento River, California, 1987-1990. M.S. Thesis, California State University, Chico.

Hughes, J.M. 1999. Yellow-billed Cuckoo (*Coccyzus americanus*). *In:* A. Poole and F. Gill (eds.), Birds of North America, No. 418. The Birds of North America, Inc., Philadelphia, Pennsylvania.

Laymon, S.A. and M.D. Halterman. 1985. Yellow-billed Cuckoos in the Kern River Valley: 1985 population, habitat use, and management recommendations. California Department of Fish and Game, Nongame Bird and Mammal Section Rept. 85.06.

Laymon, S.A. and M.D. Halterman. 1989. A proposed habitat management plan for Yellow-billed Cuckoos in California. USDA Forest Service Gen. Tech. Rep. PSW-110 p 272-277.

Laymon, S.A., P.L. Williams, and M.D. Halterman. 1993. Monitoring of riparian habitat restoration sites: Breeding birds and habitat characteristics, 1992, and Yellow-billed Cuckoo study, 1992. Admin. Rept. The Nature Conservancy, Kern River Preserve, #CARO 060894. and California Dept. of Fish and Game #FG1496.

Laymon, S.A., P.L. Williams, and M.D. Halterman. 1997. Breeding status of the Yellow-billed Cuckoo in the South Fork Kern River Valley, Kern County, California: summary report 1985 -1996. Admin. Rept. USDA Forest Service, Cannell Meadow Ranger District, Sequoia National Forest.

Laymon, S.A. 1998. Yellow-billed Cuckoo survey and monitoring protocol for California. Available from the author, P.O. Box 1236, Weldon, California 93283. E-mail: slaymon@lightspeed.net

Oberholser, H.C. 1974. The Bird Life of Texas. Univ. of Texas Press, Austin, Texas.

Roberson, D. 1980. Rare birds of the west coast. Woodcock Publications, Pacific Grove, California.

Warner, R.E. and K.M. Hendrix. 1985. Riparian Resources of the Central Valley and the California Desert. Final Draft Admin. Rept. Calif. Dept. of Fish and Game.